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Research programmes at national level make up one of the most explicit interfaces between politics and research.

Scientific work and research are multi-actor activities where networks across institutional borders are a significant, often predominant characteristics of the organisational format of the activities. Research management is not a matter of central master plans and one-sided top down planning. Moreover, research management is a dispersed phenomenon. It is not gathered in one single location, at one single decision maker. It is a normal aspect of ordinary work of individual researchers and scientists to think strategically, coordinate and align actors and activities, disseminate goals, make decisions and prioritisations etc. Many researchers actively contribute to developments of networks, organisations and practice communities. At the same time, institutions and professional position of actors are of high importance in research management. And so are actor constellations, support from interests groups, interests, power and politics as well as interaction with the political and regulatory system not least at the national level. Public policy and governance of science and research is thus also an important aspect of research management.

National research programmes are one of the places where research management at national level is carried out; where prioritisations and decisions influencing the country's research community are made.

In this text we consider strategy processes in national research programmes as one of the most central places for research management and governance. The study investigates how, and under which conditions, strategy plans are developed, which actors that are involved in the strategy developments, and which rationales, systematics and structuring means that are employed in the strategy processes.[1]

By national research programmes we mean central national research funding functions and funding institutions with a specifically, be it broadly or narrowly, defined area of work. Examples of national research programmes are both strategic research programmes within specific resort areas, problem fields or sectors often connected to a specific ministry of the country, and more general research councils connected to ministries of science and research. It is the general and over-all strategies of the research programmes we focus on rather than the strategic aspects involved in, say, decision on funding of a single project within the programme or in, for that sake, the establishing of the programmes. These different strategy aspects are of course often interrelated.

The examples used are primarily from two different, but related research programmes in Denmark namely the strategy processes of the Technical Research Council (STVF) and of the Energy Research Programme (EFP).

[1] The study is funded by the Danish Social Science Research Council (SSF) and Risø National Laboratory.

Research programmes between research and politics (background)

Though national research programmes in many countries account for a smaller amount of the total research funding compared to the funding through universities' and research institutions' basic resources and to the funding from companies (in Denmark around 20-25% of public research is funded through research programmes (Forskningsstyrelsen 2003 p. 9-11)), national research programmes play a quite important role for the development of science and research.

National research programmes often channel money to emerging new important research areas and topics coming up. By this they contribute to changes and development of new directions for research institutions and for the research community in general. The strategies and micropolitics of research programmes can thus have a central role, in some cases pivotal role, in the broader strategies and developments of science and the research system. To manage national research programmes is a highly important part of research management in general.

The dynamics the programmes induce are at another pace and cadence than the structural institution dynamics and development patterns of universities. By being a second string of research funding in addition to the national basic funding of the research institutions, the research programmes contribute to competition in the research system. The competition is not only between institutions but also between individual researchers, research areas and approaches. At the same time, research councils and other national research programmes can be an important arena for coordination and formulation of common views between researchers and institutions.

National research programmes are influenced by national policy. Not only are the programmes by their definition created through governmental decisions and prescriptions. They are often also in frequent contact and interaction with national policies of research as well as policies of other areas. This happens e.g. through reporting on the activities and developments in the areas they deal with, through communication about new state budget proposals and new important areas of research. Much of the interaction happens through the ministries and the administrative-regulatory system there.

Practice and management activities in the national research programmes also reflect and are influenced by the research fields and areas of work of the programmes. With the position in central, national administration, strategy processes in national research programmes thus appear under influence of both current tendencies in general policy practices and norms and current understandings and change trends in connection with science and research. The programmes mediate between national politics and the programme areas and their institutions.

In this mediating arena between politics and research, the managers of the research programmes are in a situation where they in practice must secure appropriate strategy development for the programme. They shall address questions of how the subject area of the programme shall be described and understood and which means and measures are needed to develop the programme or to, at least, secure the programme's cohesion and existence.

The programme managers have to consider which information and experience areas that shall be employed to develop the strategies, who shall in practice be involved in the strategy processes, and which methods and approaches for the strategy developments that are practically feasible and appropriate as well as fair and suitable in consideration of the programmes definition and position and of the related parties. This also includes questions of how legitimacy and accountability for the programme is supported and considerations of which interests and needs that shall be satisfied e.g. in order to maintain support for the programme.

The strategy processes in national research programmes reflect the influences from the surroundings of the programmes not only in the sense that they reflect specific topics of current interest in government, in research communities etc. They also reflect the broader discourses and norms about the character of science and its role in society. With their central position in national research policy and research management, national research programmes is a place where discussions of the social contract for science and research, as it metaphorically has been coined (Guston 1994), take place. The societal role of research and the identity and position of science in society are also negotiated in the strategy developments.

With the close connection to politics and the central position in general, the aspects of the current changes in the identity and societal role of science and research can in many cases appear explicit and very distinct in the interaction in and around national research programmes. For example, aspects of the societal demand for research cf. the Mode 1 – Mode 2 discussions (Gibbons et.al. 1994) are often clearly pinned out.

What is interesting about studying strategy processes of national research programmes in the perspective of the changing role and identity of science in society, is not least which typical actor roles that are inscribed in the strategies and, especially, what picture of the role and character of science that is present. The represented understandings of knowledge development processes and, as we focus on national research programmes that are to a considerable extent technology-oriented, the understandings of technology development and technology areas are also important and central issues.

Strategies and realities are two sides of the same coin. You cannot separate them from each other and they are deeply integrated in each other. This does not mean that it is impossible, as we do in the study behind this paper, to focus on the strategic aspects and strategy processes, but it means that you will have to consider the situation and contexts of the strategies and the subject areas it is *strategies for* when doing the study. Approaches that make a clear cut between strategic aspects and non-strategic aspects are of limited value. For normative suggestions and recommendations it also means that you cannot just directly copy approaches from one area to another.

In our research project, there is focus on technology-oriented research programmes (technoscientific programmes) i.e. programmes in which technology development is one of the most central elements. With this delimitation of the project we are lucky to have to do with a mainstream part of science and research and one of the parts that is explicitly discussed and highlighted in the research political discussions, in the media coverage and in public discussions of science, universities etc. Influential and dominating policy issues like ‘innovation’ and ‘public-private collaboration’ are addressing technology-oriented research directly as development of new technology is a very central element in these, whether it being implicit or explicit. The connection between the dominating research policy themes and other research branches e.g. social science and humanities is

unclear and often hard to find. The same can to some extent be said to be the case for concepts within current studies of research management, governance, and policy like e.g. the triple helix concept, public-private partnership, and entrepreneurship. This is however also due to a lack of alternative formulations from social science, humanities etc.

A governance perspective on science and research management (governance, STS, principal-agent)

As it is the point in the recent years' governance literature, the strategies and plans of national research programmes occur not as a governmental dictate or as autonomous processes detached from governmental influence, but is developed in interaction between governmental authorities and policies and actors in the covered activity areas. This is described as well in governance literature on science and research specifically (Hackmann 2001a+b, Fuller 2000, Glynn et.al. 2001, Fèron & Crowley 2002, Goncalves 2003) as in the more general governance literature that often emphasise the connection between forms of governance approaches and the issue of democracy (March & Olsen 1995, Pierre 2000, Hirst 2000, Christiansen 1999). The question is not if there is interaction between government actors and actors relevant for the research areas to be managed, but which actor groups and networks are included in the processes, and which are excluded. Secondly, it is a question how, in which interaction processes and with which weight the different actors are represented and involved in the processes.

The 'new' governance approaches is governance in and by networks of actors. They focus on interaction and coordination between actors instead of having a hierarchical view on governance and they emphasise the importance of decentralised activities and the interplay between centralised and decentralised steering.

With this network and social coordination perspective, governance studies are in accordance with the knowledge in the field of social studies of science, technology and society dynamics (STS). These studies have documented that heterogeneity and a complex and thorough mutual integration of social and technical matters, of human and natural matters, are general characteristics of science and research in present society. The construction of new research areas and new knowledge and technology occur in interactions between heterogeneous sets of actors (not homogeneous sets of actors, e.g. not only through scientists within a well-defined area of work) and through a heterogeneous diversity of different complex dynamics. Scientific activities and knowledge are situated and influenced by the specific context. The change processes have co-shaping and network character with complex and continuous discussion, experimentation and negotiations between actors. Management of research is distributed. There is a mutual shaping of new institutional actors, power structures, and networks and new knowledge and technology.

In recent years, the classical social science principal-agent theory has shown fruitful in studies of governance of science and research, especially in studies on research programmes and funding functions (Braun 1993, Guston 2000, van der Meulen 1998). Of course there are compared to the STS studies and the governance studies limitations to this approach, given the highly simplified picture of the situation, actor set-up etc. the model with a principal and an agent offers, which does not capture the complexity and heterogeneity of research development. However, the approach throws light on the important central relation between government and research management and

the delegation of tasks and competences by the government to research councils and research programmes prescribed in formal rules and law texts.

The principal-agent studies points to the importance of boundary organisations between government and research and the central role these to some extent independent organisations play in the management and development of research. The way these boundary or intermediary organisations are structured and institutionalised is very influential on the development of science and research areas as part of society. The way the boundary organisations act and the communication and information flows in and around them are of critical importance. The constantly renegotiated relationship between research and government to a considerable extent happen in connection with the activities of these organisations.

The limitations of the principal-agent approach are also clear when it is questioned: Who is the principal and who is the agent? In some respects you might as well consider the situation in governance of science the other way around: That science policy and the national governance of science shall serve the science and make the best possible frame for science. This is also relevant in connection with national research programmes. In practice, the research actors do not consider themselves as primarily being in an agent role for the government. The understanding that science is a grass root activity which shall be facilitated by the public and the national governance rather than being steered, is an understanding you can often meet.

Another limitation of the principal-agent model is the unequal distribution of information presupposed in the model. This is not as one-dimensional as the model suggests with simply more knowledge about the field at the agent than at the principal. The information differences go along many different dimensions and are to a considerable extent a question of different perspectives.

Research processes and production of new knowledge are increasingly influenced by their surroundings and by societal demands. At the same time, science and knowledge production are getting a more central and strategic role in society and are by many considered the central driver of development and economy. This is captured in the term knowledge society. The increased focus on the strategic role of science, knowledge and also knowledge intensive technology also means that there is more attention to the strategies of research programmes.

It is widely recognised among actors involved in management of research programmes, that research and research institutions to a much higher degree than earlier, also compared to just 10 years ago, are under pressure for showing the relevance and societal use of their research and need to consider these aspects in their activities. The pressure on research and on research programmes to be able to satisfy societal demand is higher than earlier. This is in accordance with the Mode 2 – Mode 1 discussion of research.

At the same time, it is recognised that the pace in research activities is considerable higher than it was earlier and that the speed of change has gone up. We live in a change-oriented culture, where tomorrow and the ability to define what tomorrow will bring get more and more attention. Change and development (rather than continuity, stability, and tradition) are central and powerful elements in the set of values and norms within science and technology-oriented research (van Lente 1993, Brown et.al. 2000).

The emergence of the research programme instrument

The institutionalisation of national research programmes is one of the later developments of the research systems. Over the second half of the 20th century research systems have grown and become significantly more complex. While the institutionalisation and funding of public research before World War 2 by and large consisted solely in universities and other higher education institutions and the basic governmental funding of these institutions, the number of types of institutions and funding functions has increased considerable afterwards (Grønbæk 2001).[2]

In the period up till the late 1960s the research councils were created. In Denmark, the research councils system was established in 1968, though the first council, the Technical Research Council (STVF), appeared already in 1946, however in the first years without the same role as governmental funding institution as later. It was one of the reasons for establishing research councils, originally, in the western countries to ensure that direction, prioritisation and goal-setting of research were not only a matter of internal institutional strategies and prioritisation but that some coordination across research institutions was happening and that influence from outside science on the direction and goal-setting of research was possible. Development of research should not only be a matter of internal institutional policy at the universities (Foss Hansen 1996, Aagaard 2000, Guston 2000).

Research was increasingly considered an important element in the development of the welfare society and its economic growth. The role of research and innovation for societal development were also promoted by supranational organisations like OECD. Up through not least the 1970s, different ministries created a number of new public research institutions working specifically in areas of relevance to the working area of the ministry ('sector research'). In addition to the direct basic funding of the universities, the funding function of the research councils and the individual ministries were now also important parts of the total research funding.

The institutional instrument of strategic research programmes occurred as an important element in the research governance and policy in many countries in the 1980s (in Denmark primarily from the mid 1980s and on). Through the strategic research programmes were specific research and technology areas, problem fields and goals pointed out as research issues from national policy level (Aagaard 2000, Ståhle 1992).

The Energy Research Programme is in this connection an exception to the general picture in Denmark as it was established already in 1976 not least as a reaction to the oil crisis.
Other research programmes like the technology oriented TUP (The Technological Development Programme), BIOTEK (The Biotechnological Research and Development Programme) FØTEK (The Food Technology Research and Development Programme) were established between 1985 and 1990 (Floris & Rieper 1995). The establishment of the strategic research programmes can in many cases be seen as a prioritisation of research areas related to industrial policy and development (Jensen 1996).

Some strategic programmes have been administered by the resort ministries, e.g. EFP (in the Ministry of Energy, now in the Ministry of Economic and Business Affairs) and TUP (in the

[2] For overviews of the developments in the institutionalisation and governance of research systems see for example (Hansen 1996, Aagaard 2000, Grønbæk 2001, Guston 2000, Benner 2001). The three first focus on Danish developments, Guston on USA, and Benner on Sweden.

Industry & Trade Agency under the Ministry of Industry) and other programmes by the research councils e.g. BIOTEK. In many cases a cross-institutional coordination or background committee was also involved.

The research councils also became more 'strategic' in that period which can be called the strategic turn in national research management. In 1987 it was incorporated in the regulations for the research councils that a part of their task was to describe strategy plans for their working area. The obligation to define strategy plans was another means of securing strategic prioritisation and coordination across the individual research topics and research institutions (Aagaard 2000 p. 61). With a report on the state of and perspectives for the technoscientific research ("Teknisk-videnskabelig forskning: Status og perspektiver") published in 1983, the Technical Research Council was the first council to develop a strategy plan (Grønbek 2001, p. 101). In the governmental regulation text prevailing from 1997 up till now, the obligation to make strategies is stated like this:

"The tasks of the national research councils in connection with the support of Danish research include: ... ...2) A strategy function, where the councils produce strategy plans that can lead to research council initiatives or to strategic programmes, which can be established by relevant ministries."[3]

The strategy plans produced by the research councils are five-years plans. The annual one-year plans that not least are used as input to the state budget negotiations in the Government and the parliament are by many of the involved actors considered at least as important. They e.g. play a role in connection with initiation of new strategic research programmes. Usually the one-year plans are coordinated with the five-years plans.

Together with the occurrence of the knowledge society over the last decades, research policy has grown in many countries. It is made more and more explicit and pronounced. Science is now something that shall be governed like many other societal issues.

Over a 15-year period the research ministry in Denmark has developed from being a small, new ministry with a few tasks and relatively little influence to an important and influential ministry visible in the general national policy and on some issues with a coordinating and leading role for other ministries. After 5 - 10 years of debate and organisational experiments, new basic laws about the universities and about the research advisory and funding system were decided upon in Spring 2003. The adoption of these new laws can be seen as the culmination so far of the power of the research policy and the research ministry. (The name of the ministry is at present Ministry of Science, Technology and Innovation.)

For a long time it has been normal to look to other countries and the way they constitute their public governance institutions when changes in the structure and institutional set-up shall be made (Foss Hansen 2000 and 1996). In this way, the development of ministries of research has occurred in parallel in many European countries. However, it turns out that, though similar at a first glance, the specific constitutions of the institutions in the different countries are often very much of local character and influenced by the specific political and cultural context.

[3] The Danish Minister of Research, Jytte Hilden, LBK nr. 676 af 19/08/1997 Bekendtgørelse af lov om forskningsrådgivning mv., § 4b (my translation)

Other current issues in science governance

Apart from the above-mentioned general tendencies of knowledge society, strategic turn, network governance etc. managers of national research programmes is currently facing a number of other specific challenges and trends that will influence the practice and strategies of the research programme management in the coming years.

One of them is the business and industry orientation of public research and universities. This development is not exactly new as there have also in the late 1970s and the 1980s been called for increased industry-university collaboration not least in the technology-oriented areas. The tendency has however also in the latest years been enforced and strengthened in research policy and debates on the topic. The new Danish university law include the business and industry representation in the boards of the universities and is but one of the recent examples of the direction of public research towards business and industry.

The business and industry orientation has been increasingly routinized over the last 25 years and is to a larger and larger extent seen as a norm for public research activities. It has to a considerable extent become a part of the identity of technoscientific activities. The role for science in this techo-economical world order is to be suppliers to industry and through this contribute to the economic growth of society cf. e.g. also the recent publication by the Danish government 'From thought to invoice' ('Fra tanke til faktura'). This discourse builds to a large extent on the understanding and metaphors of the 'linear model' of development going from scientific idea over technology and innovation to diffusion and industrial production and consumption. This model is not supported by studies of science and technology dynamics or studies of the dynamics of knowledge society.

One of the other important current trends in the management of the research programmes is the Europeisation. The increasing importance of the European Union in societal development, legislation work, policies, trade and production in general is a phenomenon that might influence the strategies of national programmes significantly. There is an increase in trans-national relations and networks, reflected in terms like globalisation and internationalisation and the role of the national state is diminishing.

With the European research programmes and the thoughts about a European research area and a European Research programmes, the national research programmes is now in a situation where there is another level of research funding and research coordination. This is not least important in the technology-oriented areas. The programmes and the national research governance in general are currently developing practices that can handle this and coordinate the national efforts with the European. The increasing dominance of English language is also a part of the Europeisation and the cross-national harmonisation that is happening. In science and research however, English have for a long time been one of the most used common languages.

Current issues in Danish programmes: The Energy Research Programme (EFP)

The Energy Research Programme is managed by the Danish Energy Authority located in the Ministry of Economic and Business Affairs (earlier in the Ministry of Environment and Energy).

The research programme has traditionally been considered a strategic programme and is closely connected to Danish energy policy and government. The program strategies are coordinated with the general governmental plans on energy issues and e.g. also with the general national research strategy developed in mid 1990s (Miljø- og Energiministeriet 1995 and 1996).

The strategy processes of the Danish Energy Research Programme is performed by the Energy Authority in interaction with, apart from the ministry and government, the energy systems operators (semi-public power production and network operators), industry and the research community. Apart from the system operators, the set of industry actors not least consists in manufacturers of energy generation technologies and of building energy equipment like pumping systems and isolation products. A board of high-level industry and research representatives, The Advisory Council for Energy Research (Det Rådgivende Energiforskningsudvalg, REFU), is central in the strategy development and in the definition of the priority areas of the programme. Up till recently the list of priority areas has looked like this (with smaller changes from one year to another, IEA 1999 and Energistyrelsen 2002b):

1. Oil and gas
2. Biomass
3. Production of electricity and heat
4. Wind energy
5. Energy consumption in buildings and solar energy
6. Advanced energy technologies (fuel cells, super conductors etc.)
7. Electricity savings and electricity efficiency
8. Energy and society
9. Industrial processes and products

Advisory committees for each of the identified priority areas are established with members from the industry and research institutions working in the area. The committees play an essential role for the programme and provide input and background papers to strategy developments (IEA 1999). There is a relatively strong network between the programme management and the established industrial actors and research actors in the energy technology field.

In this sense, the strategy processes of the energy research programmes correspond to the interaction perspective in the governance literature and to the Mode 2 model of research. Demands for the research are inscribed in the strategies through the energy systems actors, the industrial actors and through governmental policy primarily. Considerable parts of the connections to the industrial and energy system actors have lasted for long time and are relatively strong and stabile. Therefore it can at least in some respects be said that there is a partnership between government and the established industry and research institutions in connection with the energy research programme.

The Danish Energy Research Programme has experienced some turbulence in the latest years, after the change in government in 2001. From a level of around 100 million DKr a year, the program was cut down to less than half (40 mill DKr in 2003), but is expected to be around 70 mill DKr in 2004 (Miljø- og Energiministeriet 1999 and Energistyrelsen 2003b). In this turbulent period, the advisory council in their own name developed a recommendation for a strategic (REFU 2002). The government have however not approved this suggestion of a strategy.

Given the smaller total budget for the programme, it was decided that the strategy development in 2003 should be concentrated on four areas only: Biomass energy, solar cells, wind energy and fuel cells. Both in these current activities and in the advisory council's strategy recommendation, is the technology focus stronger than in the earlier program strategies. There is presently a call from among other the energy systems operators for a new general and comprehensive strategy for Danish energy research (e.g. Eltra 2003).

Current issues in Danish programmes: The Technical Research Council (STVF)

As one of the six traditional research councils in Denmark, who have now existed for more than three decades, the Danish Technical Research Council develops five-year strategy plans. The 15 members of the council are researchers, primarily from universities. As are the other parts of the 'research advisory system', the research council is located in the Danish Research Agency under the Ministry of Science, Technology and Innovation. The amount of research money managed by the Technical Research Council is in the order of 100 million DKr a year plus, in some years, a limited number of special programme appropriations in the national budget targeted specifically at issues defined in the budget.

The latest strategy plan for the Technical Research Council is Strategy Plan 2003-2007 published in August 2002. The development of this research plan turned out to consist in three main phases:

1. Visions papers development
2. Definition of strategic efforts ('strategiske satsninger')
3. Elaboration of communication format

The actors involved in the interaction on the development of the plan were primarily the research council members and the employees in the Research Agency. Large parts of the interactions, including the decisions on how to advance in the process, consisted in discussions internally in the council. Of the council members, the chairman and a working group including also a couple of other members carried out much of the work.

In the first phase, however, a number of Danish technoscientific researchers outside the council were asked to write papers about their visions on developments in their research areas as input to the strategy process. Together the vision papers should cover all the different areas within technoscientific research. The authors, which came from public research institutions, primarily, but also from private enterprises, were handpicked by the council as experienced, visionary persons, able to describe also broader, cross-disciplinary thoughts about development of the research. Around 45 vision papers were submitted.

Over the second half of 2001, the council members described and discussed the different areas of technoscientific research, building on among other things the vision papers. On the basis of this, 7 strategic areas we defined for the strategy plan. The strategic areas can to some extent be seen as a representation of main areas of technoscientific research, so that the complete field is covered all in all, integrated with specific current topics and relevant perspectives.

The strategy processes that by many of the actors are considered most important in that period are however a parallel discussion about a new measure to be employed in the councils funding function.

Through these discussions 'research consortia' are defined as a type of funding in addition to the existing instruments like engineering research centres, framework programmes, and talent projects. The research consortia instrument is a reaction to the demand for improved collaboration of public and private research. In the definition of a research consortium openness and public access to result of the research collaboration are emphasised and a number of companies (not only one) shall be involved.

The resort consortia instrument is included in the list of strategy areas for the strategy plan. The 8 areas are:

1. Biotechnology and chemistry
2. Energy
3. Environment
4. Nanotechnology
5. Production- and materials-technology
6. Information systems
7. Simulation
8. Research consortia

The third phase of the development of Strategy Plan 2003-2007 gets a more important role for the final result of the strategy work than is maybe suggested by the term communication format. Though it from the beginning of the process was clear for many of the involved persons from the council and the research agency that the strategy plan would be simpler than the previous five-year plan (1998 – 2002), a final decision on making the strategy plan in a quite brief and politician targeted format was first made in the first months of 2002. The decision has created discussion in the research council and, later, among researchers in the broader Danish technoscientific community.

Also the research agency played, in collaboration with the council, an important role in definition of this communication format. The agency elaborated a template for a handy, clear and appetizing colour lay-out which they encouraged all the research councils to follow (only the Medical Research Council resisted the brief format). The strategy plan ended up being a publication on 28 pages with many pictures, brief texts, and boxes with short examples of the use of technoscientific research and statement quotes from well-known and high level industry representatives. This shall be compared with the around 100 full text pages of the Strategy Plan 1998 - 2002[4]. A lay-outer and a PR company were hired to go into the work with the finalisation of the publication.

Compared to the earlier five-year plans, Strategy Plan 2003 – 2007 is aimed at politicians, primarily, trying to convince them to give more money to the technoscientific area. While the earlier plan focused on the 'internal' prioritisation and strategic action in the research council and on the different sub-areas within the main areas of technoscientific research, the plan for 2003-2007 emphasizes the societal importance of technoscientific research; that technoscientific research makes a difference for society.

The development of earlier strategy plans as well as strategy plans of other research councils e.g. the Natural Science Research Councils have employed broader hearings in the strategy development process. A mediating and coordinating role for the 2003 – 2007 plan within the research community as well as internally in the research council is not expected. In practice there are indications that the strategy plan at least to some extent, however, has some coordination and direction-giving effect on

[4] The number of pages refers to the internet published version of the plan

the research community. More concrete initiatives or action plans from the research council following the strategy plan are not expected for the time being.

Apart from actors mentioned above: the research council members, the agency employees, the PR company and the vision paper authors, only few other persons have been involved directly in the development of the Strategy Plan 2003- 2007.

The strategic work of the management of the national research programmes is not always devoted to pointing out priority research areas and describing plans for exploration of them but can have many other purposes and functions. Only some of them have been mention above. Below is a tentative list of the functions identified in the Danish Energy Research Programme and the Technical Research Council.

Tentative list over strategy functions

(STVF:)

The strategy of covering all existing research areas
- supporting existing areas

The strategy of more money
- getting attention to technoscientific research; by showing its societal importance

The strategy of no strategy

The strategy of strength areas

The strategy of coordination

The strategy of gaps and weak points

The strategy of technoscientific territory
- demarcation, not least against natural science and the natural science research council

(EFP:)

The strategy of new technologies

The strategy of developing new production and consumption systems

The strategy of serving industry

Perspective: The new laws on research governance system – (the challenges for the strategic research council, STVF and EFP)

By the beginning of 2004 the managing of Danish national research programmes faces new challenges and the conditions for strategy processes in the programmes are changed on important points. By the new law about the research advisory and funding system, the system now consists of the Research Policy Advisory Council, the Strategic Research Council and the so-called Free Research Council.[5] In the latter there shall be defined a number of 'professional research councils' ('faglige forskningsråd) , c.f. e.g. the Technical Research Council up till now.

In the new law there is no obligation for the Professional Research Councils to formulate strategy plans. Whether or not an explicit strategy plans, research programme management contain strategic aspects and de-facto strategies will exist. The strategic processes will not least consist in the definition of the funding practice and the instruments. Also the definition of the councils' business procedure will be of strategic importance.

The new law emphasises open competition the for national research money granted through programmes etc. and that scientific ('forskningsfaglig') based quality assessment shall be carried out before decisions of funding are made. The Strategic Research Council shall deal with thematically delimited and politically prioritised research areas. It shall approve the funding procedures of other ministries research programmes like the Energy Research Programme, and it shall do scientific ('forskningsfaglige') assessments of the application within these programmes. It is obvious that a lot of coordination is needed to make this process run.

The Strategic Research Council shall look for new research tendencies and can in interaction with the Parliament start new initiatives. However, it is, despite the name, not the Strategic Research Council, but the Research Policy Advisory Council that shall explicitly deal with strategic aspects of the national research governance, initiation of larger new research initiatives, as well as development of the general national research strategy.

Perspective: The coordination of Danish Energy Research – a trial balloon

A trial balloon for the new conditions of management of national research programmes has been the strategic coordination of the management in the energy research area that has taken place in the last year. The applications for the Energy Research Programme are now also, following the intentions of the new law, evaluated in the Technical Research Council and not only in the programme management in the Danish Energy Authority. However, the coordination goes further than that and has other reasons than the new law e.g. the mentioned turbulence in the governmental support of energy research. It is a strategically attempt to make the different research funding sources in the energy area work together. Energy research funding, apart from the Energy Research Programme and the energy research funding from the Technological Research Council, also comes from e.g. the governmental renewable energy programme and the so-called 'PSO' money managed by the energy systems operators. A coordination group with representatives of the different energy research programmes etc. carries out the strategic management and coordination in the energy area.

[5] Ministry of Science, Technology and Innovation 2003: Lov om forskningsrådgivning m.v., L142, approved by Parliament May 22, 2003. The law also define a 'coordination board' to coordinate between the councils a.o.

That it is the Technical Research Council that in practice carries out the scientific quality assessment of the applications in the Energy Research Programmes can be seen as yet another contribution in direction of defining the energy research programme as a technology research programme, primarily.

Observers in the system expect that the new regulation will result in a number of new national research programmes defined in connection with the parliamentary state budget negotiations. It is still an open question whether the so-called arm's length principle will be realised effectively.

Whether this attempt to constitute an organisational border between strategic and non-strategic research i.e. between on the one hand thematically delimited and politically prioritised areas and on the other hand a researcher initiated research, is practically feasible and not over bureaucratic, is an open question.

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